

Public Health and GIS

Danielle Sadakhom, Nick Sardo, Nick Delutis

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Abstract:

This report explores the relationship between an individual's mental health and their environment. We observed the mental health visit percentages for certain demographics among Toronto's 140 neighbourhoods. For this report the main focus was to look at quantifiable measurements. In this specific case external, physical factors were looked at. This includes: socioeconomic status and green space accessibility. A spatial analysis was also completed, mapping the average distance to a mental health facility by neighbourhood.

Introduction:

This report's objective is to explore the relationship between an individual's mental health and their environment. Our research is based on the following comparisons: surrounding environment (neighbourhood access to green space), socioeconomic status (neighbourhoods with low-income families vs. higher income families), and the average distance to a mental health facility by neighbourhood. Our objectives are to discover if there are any connections between the common notions that a person's affluence, or their access to care or green space has any impact on their mental health.

Many believe that the droll 9-5 city life can have an impact on an individual's mental state, so this was one of our core objectives to explore. The other core objective was to find if there was any merit behind a wealthy person having "nothing to worry about", thus our exploration of mental health visits on both affluent, and less affluent communities. Lastly, we decided to explore the idea of individuals not being close enough to a facility to receive proper care.

Mental illness occurs when the brain is not working the way it should. It is a collection of disorders, and the symptoms can vary depending on the illness. Statistics show that mental illnesses are common and widespread, and 1 in every 5 Canadians will have a mental health problem at some point in their lives. It affects males and females, young and old, every race and socio-economic group. Mental illness can take many forms. It's still feared and misunderstood by many people. Fortunately, all mental illness can be treated. The various types include the following:

- Anxiety Disorders
- Bipolar Disorder
- Depression
- Eating Disorders
- Mood Disorders
- Obsessive Compulsive Disorders
- Schizophrenia
- Self-Injury
- Suicide
- Violence

Procedures:

We gathered the information we needed predominantly from online databases such as Toronto open data and the Toronto Health Profiles. First off, we wanted to use Toronto open data to download the location of all mental health facilities in Toronto. We would use this to measure the distance from the centre of a select few neighbourhoods to the closest mental health facility, ultimately telling us the average time from each neighbourhood to the closest facility. In order to do so, we needed to also download Toronto centreline data so that the mapping could be done correctly. To test our hypothesis of mental health being affected by ones environment, we downloaded data from the Toronto Health Profiles. This data included the location of green space in Toronto (we wanted to see the accessibility of green space in Toronto neighbourhoods), as well as the income of families, both high and low, based on the 2006 census. This database also provided us with a percentage of mental health visits from three different age groups (20-44, 45-64 and 60+). We gathered information from areas such as the Bay Street Corridor, High Park North and Downsview-Roding-CFB.

Results & Discussion:

Surrounding environment:

(Mental health **visits** % based on the population)

3 Different Age Brackets: (BOTH SEXES)

(20-44)

(45-64) = [Average population affected]

(65+)

Green Space:

Downsview-Roding-CFB (26):

(20-44): 12.0%

(45-64): 15.9% = **15.3%**

(65+): 18%

York University Heights (27):

(20-44): 11%

(45-64): 14.2% = **13.46%**

(65+): 15.2%

Westminster-Branson (35):

(20-44): 9.3%

(45-64): 13.5% = **12.3%**

(65+): 14.1%

Lansing-Westgate (38):

(20-44): 9.7%

(45-64): 12.9% = **12.2%**

(65+): 14.0%

Bridle Path-Sunnybrook-York Mills (41):

(20-44): 9.2%

(45-64): 10.6% = **10.36%**

(65+): 11.3%

O'Connor-Parkview (54):

(20-44): 14.1%

(45-64): 17.4% = **15.73%**

(65+): 15.7%

South Riverdale (70):

(20-44): 12.5%

(45-64): 15.4% = **13.43%**

(65+): 12.4%

High Park North (88):

(20-44): 10.7%

(45-64): 15.5% = **14.03%**

(65+): 15.9%

Bendale (127):

(20-44): 10.2%

(45-64): 12.2% = **10.70%**

(65+): 9.7%

Rouge (131):

(20-44): 9.6%

(45-64): 11.0% = **9.83%**

(65+): 8.9%

Low Green Space:

West Humber-Clairville (1):

(20-44): 10.8%

(45-64): 13.0% = **11.46%**

(65+): 10.6%

Eringate-Centennial-West Deane (11):

(20-44): 12.1%

(45-64): 15.3% = **13.86%**

(65+): 14.2%

South Kingsway (15):

(20-44): 10.7%

(45-64): 12.7% = **12.43%**

(65+): 13.9%

Alderwood (20):

(20-44): 12.2%

(45-64): 16.1% = **13.86%**

(65+): 13.3%

Pelmo Park-Humberlea (23):

(20-44): 14.7%

(45-64): 17.0% = **14.76%**

(65+): 12.6%

Bayview Village (52):

(20-44): 10.2%

(45-64): 12.4% = **11.86%**

(65+): 13.0%

Bay Street Corridor (76):

(20-44): 8.8%

(45-64): 14.7% = **12.46%**

(65+): 13.9%

Trinity-Bellwoods (81):

(20-44): 11.4%

(45-64): 16.7% = **14.2%**

(65+): 14.5%

Rosedale-Moore Park (98):

(20-44): 9.9%

(45-64): 13.4% = **11.66%**

(65+): 11.7%

Wexford/Maryvale (119):

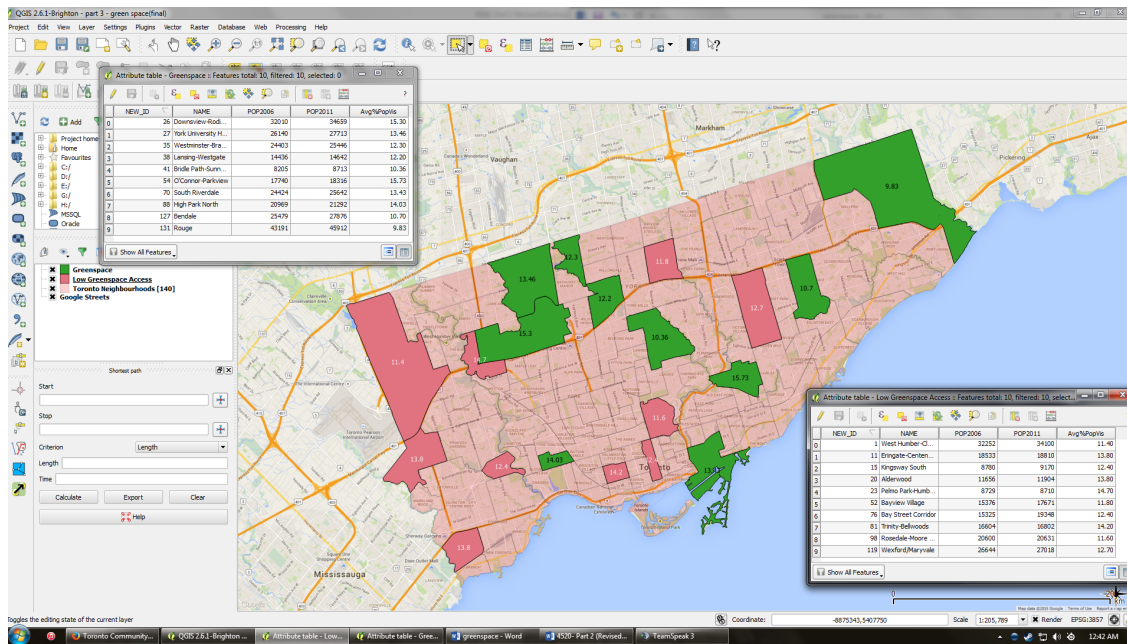
(20-44): 12.2%

(45-64): 14.3% = **12.76%**

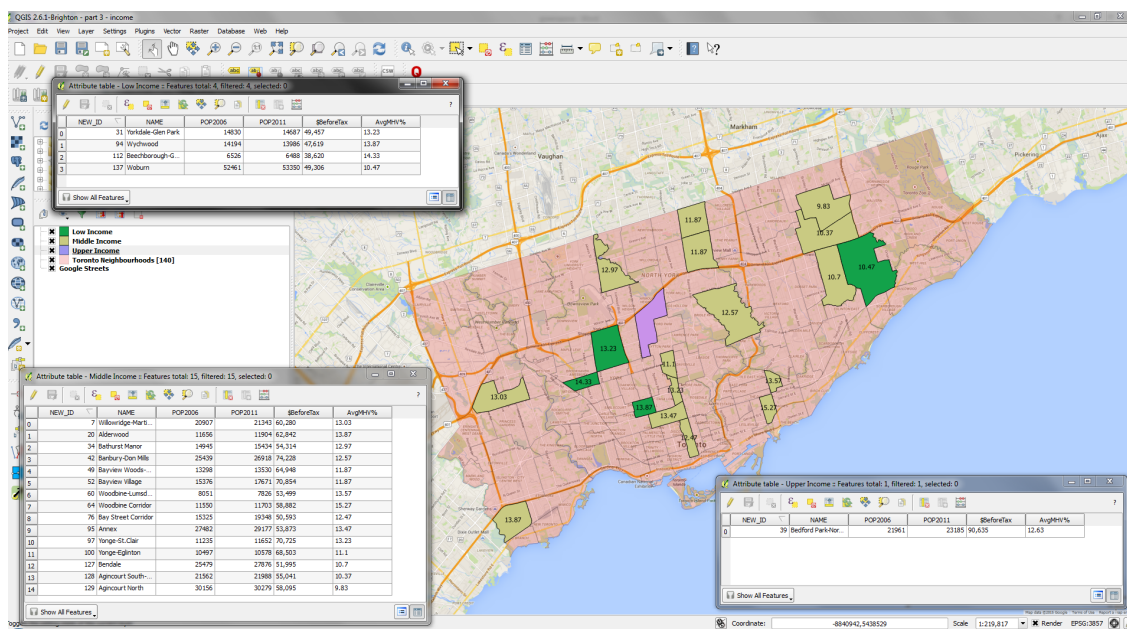
(65+): 11.8%

20 - Alderwood: Median Household Income before-tax \$: 62, 842 (13.87%)
31 Yorkdale-Glen Park: Median Household Income before-tax \$: 49, 457 (13.23%) -->
31
34 Bathurst Manor: Median Household Income before-tax \$: 54, 314 (12.97%) --> 34
39 Bedford Park-Nortown: Median Household Income before-tax \$: 90,635 (12.63%) -->
39
42 - Banbury-Don Mills: Median Household Income before-tax \$: 74, 228 (12.57%) -->
42
49 Bayview Woods-Steeles Profile: Median Household Income before-tax \$: 64, 948
(11.87%) --> 49
52 Bayview Village: Median Household Income before-tax \$: 70, 854 (11.87%) --> 52
60 Woodbine-Lumsden: Median Household Income before-tax \$: 53, 499 (13.57%) -->
60
64 Woodbine Corridor: Median Household Income before-tax \$: 58, 882 (15.27%) --> 64
7 Willowridge-Martingrove-Richview: Median Household Income before-tax \$: 60, 280
(13.03%) --> 7
76 Bay Street Corridor: Median Household Income before-tax \$: 50,593 (12.47%) --> 76
94 Wychwood: Median Household Income before-tax \$: 47, 619 (13.87%) --> 94
95 - Annex: Median Household Income before-tax \$: 53, 873 (13.47%) --> 95
97 Yonge- St. Clair: Median Household Income before-tax \$: 70, 725 (13.23%) --> 97
100 Yonge-Eglinton: Median Household Income before-tax \$: 68, 503 (11.1%) --> 100

112 Beechborough- Greenbrook: Median Household Income before-tax \$: 38, 620 (14.33%) --> 112
 127 Bendale: Median Household Income before-tax \$: 51, 995 (10.7%) --> 127
 128 - Agincourt South-Malvern West: Median Household Income before-tax \$: 55, 041 (10.37%) --> 128
 129 - Agincourt North: Median Household Income before-tax \$: 58,095 (9.83%) --> 129
 137 Woburn: Median Household Income before-tax \$: 49, 306 (10.47%) --> 137

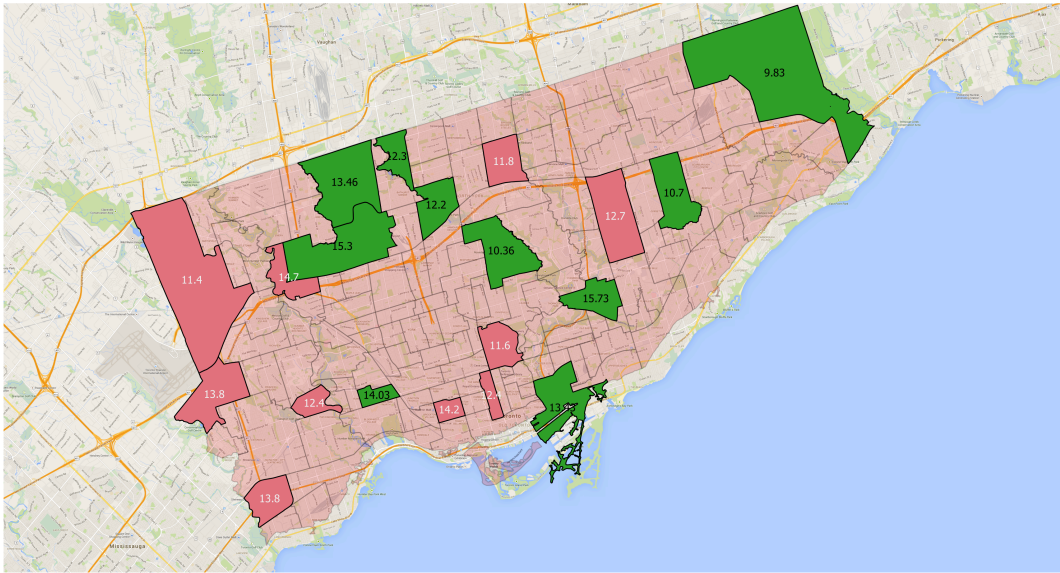


- Attribute table for the Access to Green Space map



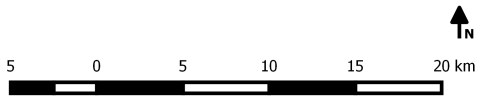
- Attribute table to the Income map

Access to Greenspace VS Average Mental Health Visits by Population

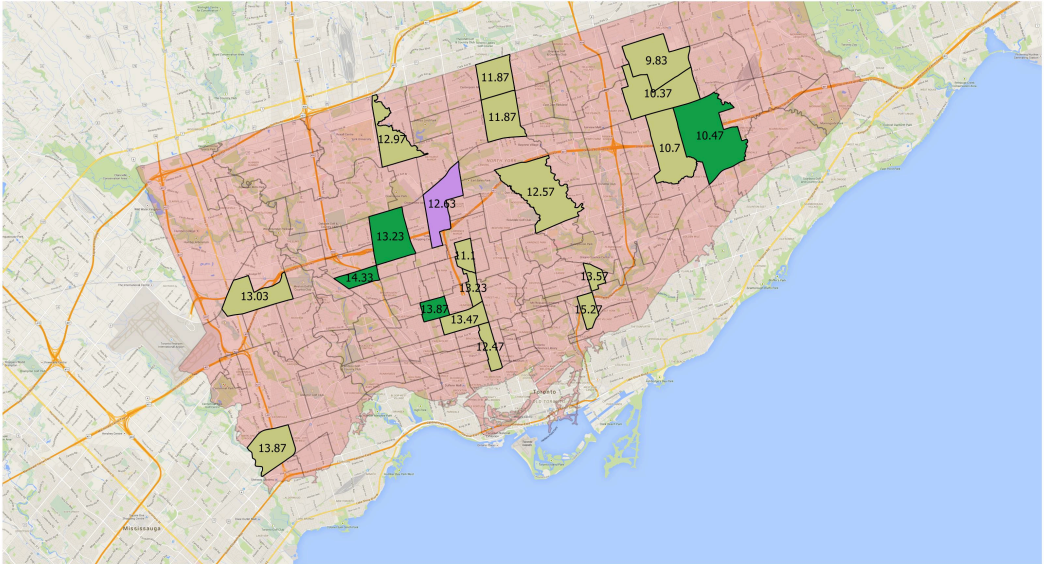


Legend

- Greenspace
- Low Greenspace Access
- Toronto Neighbourhoods [140]
- Google Streets

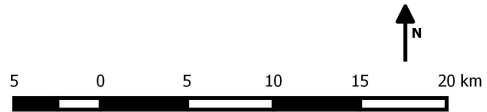


New Sample of Income VS Mental Health Visits



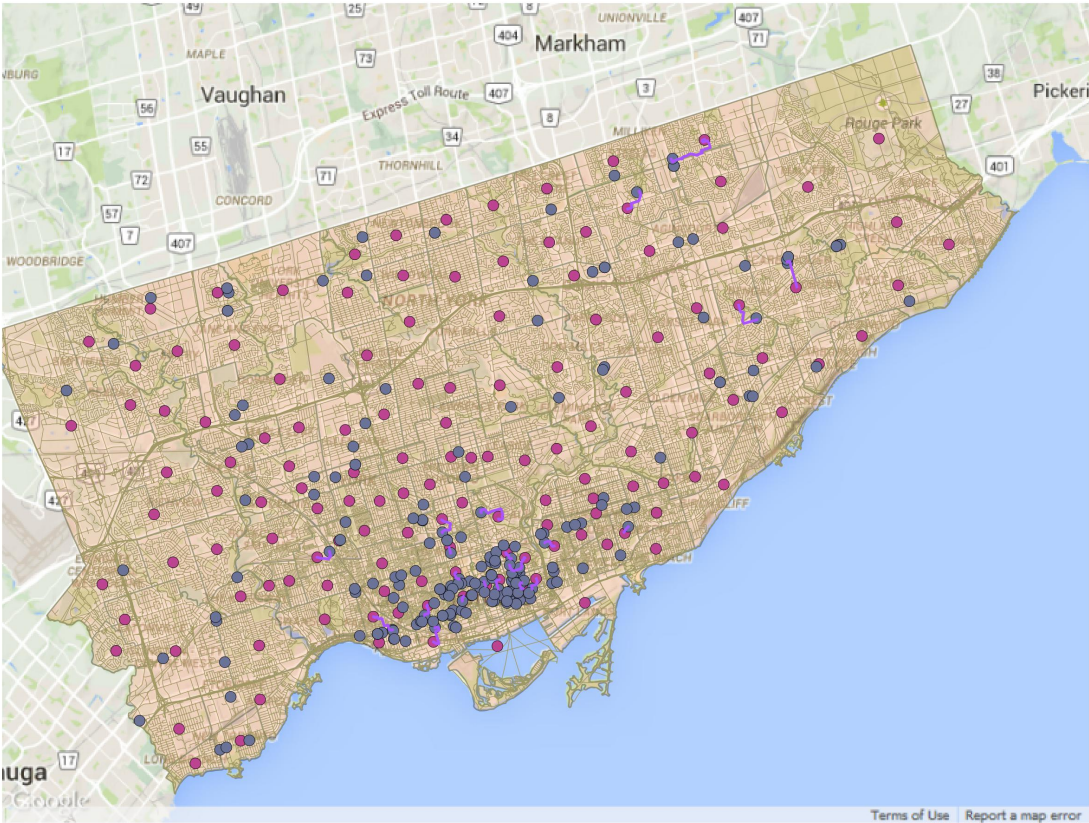
Legend

- Low Income (<\$50,000)
- Middle Income (\$50,001-\$80,000)
- Upper Income (>\$80,000)
- Toronto Neighbourhoods [140]
- Google Streets



We have expanded our research area in order for us to locate any possible links between mental illness, green space, and income. Although we have increased the number of neighbourhoods to complete the study, we did not find any evidence to prove that these two factors influence the likeliness of an individual having mental health problems.

Shortest Paths to Neighbourhood Mental Health Centres



Legend

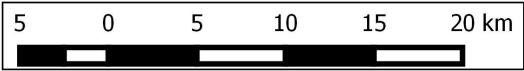
Shortest Path

Mental Health Centres

Centroids

CENTRELINE

TorontoNeighbourhoods



- Below is the attribute table for the shortest path to a mental health facility in various neighbourhoods within Toronto.

Length (Km)	Time (Seconds)
0.39	0.02
0.5	0.04
0.18	0.04
1.2	0.12
0.64	0.05
1.34	0.21
0.89	0.36
1.19	0.07
1.59	0.1
2.85	0.11
1.16	0.08
0.26	0.1
0.42	0.08
0.29	0.04
0.61	0.04
0.42	0.02
1.39	0.11
0.61	0.031
0.23	0.06
1.08	0.13
1.82	0.18

Conclusion:

The conclusion that we have come to is that there is still room for error. There is a possibility that the shortest paths to mental health services could vary depending on different factors involved. When calculating the shortest path, one must take into consideration the amount of traffic due to vehicles, pedestrians, and construction. We found that the majority of the mental health services are located around the downtown core of the city. Those located in the east and west end of Toronto are sparse, and could possibly not offer as many services as those downtown.

We have also concluded that socioeconomics and green space do not affect the probability of an individual having a mental illness. We have expanded our neighbourhood data to see if it would prove that our hypothesis was correct. However, we could not see any noticeable change to prove that the purpose of our project succeeded.

Mental illness can affect anyone, regardless of age, gender, sexual orientation, economic status. It is not based on one sole factor, and can happen at any time in one's life.

Appendices:

Works Cited

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Accessed on: April 30th, 2015